


# Program Lifecycle Methodology


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**Version 1.7**  
March 30, 2011

 <b>California ISO</b> <small>Shaping a Renewed Future</small>	Program Office	Template Version:	1.7
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## REVISION HISTORY

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1.2	10/22/08	Updated with feedback	Hkelley
1.3	1/7/2009	Copy edited	Kevans
1.4	4/22/2010	Updated to incorporate CMMI Level 3 process areas	M. Lucas
1.5	10/14/2010	Add SDLC Lite as a lifecycle, updated section 3 on project type determination, updated the team roles and responsibilities in section 6.	S.Ballard
1.6	2/2/2011	Added Information Technology Infrastructure Library (ITIL) references were applicable, clarified that "No System Impacts" is a Non-IT project and follows the Non-IT Project Lifecycle	S.Ballard
1.7	03/30/2011	Revised SDLC Lite definition to include projects with less than 200 hours of vendor development time, updated header with template version and date.	S. Ballard

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# 1 OVERVIEW

## 1.1 PURPOSE

The purpose of this document is to define the methodology for program and project management at the California Independent System Operator (ISO). The goal of this methodology is as follows:

- Provide a baseline set of program/project management and system development processes at the California ISO.
- Reference related processes and procedures for software development and integrating into the corporate standard processes, policies and procedures.
- Specify typical deliverables.
- Offer criteria for monitoring and measuring the products and activities of the program/project.


This methodology based on best practices from the Project Management Institute (PMI), Carnegie Melon's Capabilities Maturity Model (CMMI), the Information Technology Infrastructure Library (ITIL), and the Rational Unified Process (RUP) methodologies. It is geared towards Program Managers, Project Managers, Analysts, and Technical staff, and it is assumed these professionals are familiar with standard Project Management and SDLC methodologies.

## 1.2 Applicability

The processes specified in this document apply to all California ISO project management activities. The designated project manager is responsible and accountable for implementation of the processes described in this guide. All personnel involved in project activities are expected to be familiar with and comply with the processes set forth in this guide, regardless of the individual departments or external vendors to which they are attached.

## 1.3 Glossary of Terms

Term	Definition
ISO	(California) Independent System Operator
SDLC	System Development Lifecycle
PLC	Program Life Cycle
PMI	Project Management Institute
PMO	Program Office
CMMI	Capabilities Maturity Model Integrated
RUP	Rational Unified Process
RFI	Request for Information
RFP	Request for Proposal
IT	Information Technology
ITIL	Information Technology Information Library
PPQA	Process and Product Quality Assurance

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## 1.4 Location of Templates

All current versions of the PLC templates are available upon request to qualified vendors and business partners.

For internal employees and contractors, they are available on the Program Office department SharePoint site accessible on eCurrent.

<https://ecurrent.oa.caiso.com/departments/PO/Pages/Methodologies.aspx>

## 1.5 Changes and Modifications

Suggestions to modify the PLC methodology and process should be posted on the Program Lifecycle Web site (Note: This web site is internal to CAISO only). Each modification request must include a business case that contains:

- A description of the business or technological reason for proposing to modify this document.
- An explanation of the benefits the proposed modification can bring to CAISO.
- An outline detailing alternative considerations.

# 2 PROGRAM LIFECYCLE


## 2.1 Overview

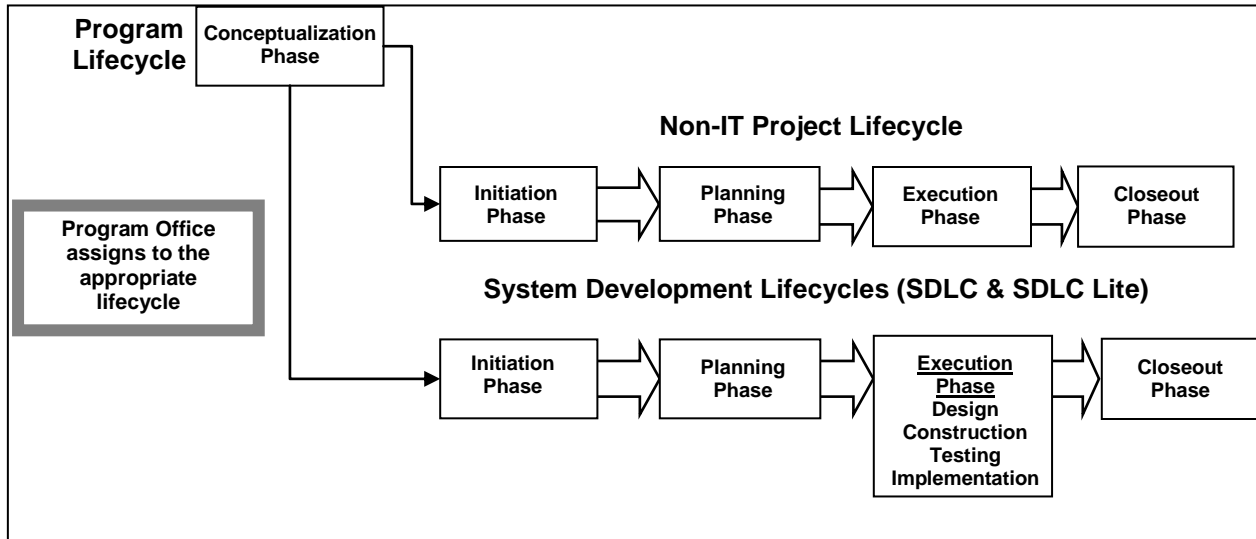
Programs are broken into several projects/phases to provide better control over:


1. Impact on Business Processes
2. Definition of new business processes
3. IT systems being developed, or IT systems integration.

Collectively, the project phases are known as the lifecycle. A project phase is a collection of logically related project activities. A deliverable is a tangible, verifiable work product such as a project schedule, a design specification or a test plan.

There are two different project lifecycles at the ISO. The Non-IT Project Lifecycle is followed for standalone projects that do not impact IT systems. The System Development Lifecycle is followed for projects that do affect IT systems (IT Projects). The SDLC Lite lifecycle is used for projects of a smaller magnitude that affect IT systems. Please refer to section 3 for details on when the SDLC Lite lifecycle is used. The Projects can also be combined into programs, which may consist of several different projects.

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## 2.2 Lifecycle Phases

### 2.2.1 CONCEPTUALIZATION PHASE

Conceptualization is the process of evaluating governance, feasibility, scope, and a Program framework for large scale programs. Only Programs are required to go through the Conceptualization phase, although it is often also helpful for any project to complete.

#### 2.2.1.1 KEY ACTIVITIES

- The Program Office or Program Manager drives this stage
- Define program scope
- Define governance model
- Assess impacts on other projects, business processes, ISO business practice manuals (BPM's), and IT systems
- A Project Manager is assigned

#### 2.2.1.2 REQUIRED DELIVERABLES AND ARTIFACTS

See the Project Classification Matrix for deliverables by project type.

#### 2.2.1.3 RELATED PROCESSES


- Impact Assessment Process
- Project Portfolio Management Process

### 2.2.2 INITIATION PHASE

Project Initiation is the official kick-off of the program/project.

#### 2.2.2.1 KEY ACTIVITIES

- The Program Office or Project Manager drives this stage.
- A Project from California ISO Release Plan is initiated.
- Gather High level (vision level) requirements.
- Complete a Project Charter document.
- Complete Rough Order Magnitude size estimates for budget and schedule.
- Determine project resources (internal or contract).
- Create RFI and/or RFP if applicable.
- Select implementation vendor if applicable.
- Engage internal ISO teams

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### 2.2.2.2 REQUIRED DELIVERABLES AND ARTIFACTS

See the Project Classification Matrix for deliverables by project type.

### 2.2.2.3 RELATED PROCESSES

Program/Project managers must comply with any and all related California ISO Policies, processes, and procedures including but not limited to:


- Requirements Management Processes
- Information Security Processes
- Program Office / Finance – Project Funding Processes
- Procurement and Vendor Management’s Request for Proposal Process
- Procurement Standard including Vendor Selection Process

## 2.2.3 PLANNING PHASE

During this phase, the project objectives are defined, and the best course of action is selected to obtain them.

### 2.2.3.1 KEY ACTIVITIES

- The Project Manager (PM) drives this stage.
- The *required* deliverables for all phases are determined based upon project type and project classification (if applicable).
- Project scope refined.
- Project Manager develops a work breakdown structure (WBS) and project schedule with appropriate milestones identified.
- Define Business Process needs (modifications, new development, etc).
- The Project Plan is finalized, reviewed by all defined and/or affected groups and individuals and approval for proceeding to the next phase.
- Risk Management Plan and Risk Log created.
- Issue Management Plan and Issue log created.
- Status Reports are created on a weekly basis.
- Initiation phase estimates for budget, scope, and resources are refined.
- Final project funding is obtained. Depending on the specific characteristics of the project, funding can be requested for the next phase or the remainder of the project.

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### Additional Key Activities for projects with system impacts – IT Projects

- Gather the project business and system requirements. Requirements should meet the existing standards Requirements Management Process. Sections that do not apply shall be noted with “N/A” to indicate that the requirements for that section had been considered. Templates are not to be modified. Appendixes should be developed for additional information.
- Perform data modeling and process modeling as appropriate.
- Engage IT resource managers and gain resource commitments. The required support personnel are defined in the project plan.
- Gather data requirements and perform data mapping as appropriate.
- Project Manager presents requirements document for review and approval to appropriate individuals. (This may be an iterative process.)
- All planning artifacts must go through a review cycle. The approval matrix outlines who should review and approve artifacts.
- Existing support documentation reviewed. Gaps identified. Support documentation deliverables are reviewed with support staff.
- Development environments are validated (if applicable).
- Test, Staging, and Production environments are identified.
- Software Quality Assurance does a review of business and system requirements.
- A test plan is started.
- High-level User Acceptance and Market Simulation planning are drafted, if applicable.
- Capacity Planning and Usage Modeling for IT infrastructure are performed.


#### 2.2.3.2 REQUIRED DELIVERABLES AND ARTIFACTS

See the Project Classification Matrix for deliverables by project type.

#### 2.2.3.3 RELATED PROCESSES

Program/Project managers must comply with any and all related California ISO Policies, processes, and procedures, including but not limited to:

- Requirements Management Process
- Information Security Processes
- Project Classification
- Program Office / Finance – Project Funding Processes
- Architectural Processes
- Infrastructure Design Processes
- Request for Proposal Process
- ITIL Processes

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## 2.2.4 EXECUTION PHASE

During this phase, the work required to produce, test, and accept the project deliverables is performed. The following sections apply to IT projects only:

- Execution (Design)
- Execution (Construction)
- Execution (Testing)
- Execution (Implementation)

### 2.2.4.1 KEY ACTIVITIES

- The project manager drives this phase of the project.
- Status Reports are created on a weekly basis.
- Actual work packages/activities are executed and measured against the project plan and project schedule to ensure the project is performing as planned.
- Final contracts with external vendors are executed and completed.

### 2.2.4.2 REQUIRED DELIVERABLES AND ARTIFACTS

See the Project Classification Matrix for deliverables by project type.

### 2.2.4.3 RELATED PROCESSES

Program/Project managers must comply with any and all related California ISO Policies, processes, and procedures, including but not limited to:


- Risk Management
- Issue Management
- Change Management
- Business Process Development Processes

## 2.2.5 EXECUTION (DESIGN)

During this phase, all necessary software or hardware modifications are designed. Test planning and preparation begins.

### 2.2.5.1 KEY ACTIVITIES

- The Project Manager and the Technical Lead drive this phase of the project.
- Requirements must be documented, approved and placed under Change Management before design begins.
- The design process includes all members of the project team, whenever possible, to facilitate the testing, documentation, and training processes. Include support personnel when appropriate, such as data analysts, database administrators, information security,

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system engineers, system architecture personnel, network services associates, and system administrators.

- The Stakeholders are involved at this stage to verify usability.
- Prototypes are developed whenever possible. Evaluate any prototypes, and make appropriate changes to the conceptual design if needed. (Prototypes are to be discarded, not evolved.)
- A baseline test plan is completed.
- Test preparation activities begin.
- The Project Manager further develops a work breakdown structure in conjunction with the analyst, technical lead, and test lead.
- The Project Manager develops a detailed schedule based upon the approved designs and testing estimates based on the test plan, within the scope of the preliminary schedule previously published in Phase II.
- The Project Manager schedules a design review for external and internal designs. Architecture, Information Security, Unix/DBA, QA, and Development needs to sign off.
- Design artifacts to addresses Business Continuity and Backup requirements in accordance with company policy.
- A list of user documentation and training materials are started.
- An information security assessment is completed.
- Test and Build environments are validated.
- Configuration Management Process is begun for the project scope.
- An update to the budget and schedule may be needed, which can affect costs. If so, a Change Request is completed and submitted to finance.
- Status Reports are created on a weekly basis.


#### 2.2.5.2 REQUIRED DELIVERABLES AND ARTIFACTS

See the Project Classification Matrix for deliverables by project type.

#### 2.2.5.3 RELATED PROCESSES

Program/Project managers must comply with any and all related California ISO Policies, processes, and procedures, including but not limited to:

- PLC Change Management Process
- Requirements Management Process
- Architectural Processes
- Information Security Processes
- Design Review Process
- ITIL - Release Management
- ITIL – Change Management
- ITIL – Configuration Management

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## 2.2.6 EXECUTION (CONSTRUCTION)

During this phase, all necessary software and hardware components are assembled and unit tested. Test planning and preparation is completed.

### 2.2.6.1 KEY ACTIVITIES

- The Project Manager and the Technical Lead drive this phase of the project.
- Development can begin even if the design artifacts are not yet approved and if the project manager deems the risk in doing so is acceptable.
- The individual modules are built and unit tested.
- Code reviews are conducted.
- Drafts of user documentation and training materials are created.
- The test plan continues to be refined as necessary.
- Test preparation activities are completed.
- Environments for build, test and staging are validated. If new environments are needed, they are built out. *Note:* depending on the status of the environments and the amount of work required, this may begin during the Planning phase.
- Quality assurance does a review.
- Status Reports are created on a weekly basis.
- Transition plan from Project to Production support is completed.
- Test System (Mercury Quality Center) set-up for project is performed.
- Production Support Materials are drafted.

### 2.2.6.2 REQUIRED DELIVERABLES OR ARTIFACTS

See the Project Classification Matrix for deliverables by project type.

### 2.2.6.3 RELATED PROCESSES

Program/Project managers must comply with any and all related California ISO Policies, processes, and procedures, including but not limited to:


- Code Review Processes
- Test Management Guidelines

## 2.2.7 EXECUTION (TESTING)

During this phase, all systems, system modifications, and processes changes are validated against the test plan.

### 2.2.7.1 KEY ACTIVITIES

- The Project Manager, Test Lead, and the Technical Lead drive this phase of the project.
- System is installed into the test environment.
- Test data is loaded.

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- Testing is completed including any applicable of the following: application testing, integration testing, information security testing, regression testing, user acceptance testing, performance testing, operational testing, and market simulation activities.
- After code reviews are complete, the project team performs testing in accordance with the test plan.
- The system is installed into the Staging environment, if applicable.
- User documentation and training materials are completed.
- End-user and support staff training is completed.
- User Acceptance and Market Simulation phases are conducted, if applicable.
- Project Manager and Test Lead prepare and submit appropriate implementation plan for approval, as required.
- Release documentation is created and distributed.
- Support documentation is created and reviewed. Business Continuity and Backup provisions are reviewed.
- Status Reports are created on a weekly basis.


#### 2.2.7.2 REQUIRED DELIVERABLES OR ARTIFACTS

See the Project Classification Matrix for deliverables by project type.

#### 2.2.7.3 RELATED PROCESSES

Program/Project managers must comply with any and all related California ISO Policies, processes, and procedures, including but not limited to:

- Test Management Guidelines
- Defect Management Processes
- Information Security Policy
- Code Review Processes
- ITIL - Release Management
- ITIL – Change Management
- ITIL – Configuration Management

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## 2.2.8 EXECUTION (IMPLEMENTATION)

During this phase, the project is implemented into production.

### 2.2.8.1 KEY ACTIVITIES

- All documentation is completed. All artifacts are ready at implementation.
- Production Implementation Plan is completed and communicated to all appropriate stakeholders and support personnel.
- End-user and support staff training is completed.
- System is installed in production.
- Production acceptance tests are completed.
- On-call support is identified for this period.
- Business Continuity and Backup plans are verified.
- System documentation is updated to reflect the as-built state of the system.
- Open technical issues get their final disposition (resolved, included in another release or project, etc.)
- Status Reports are created on a weekly basis.

### 2.2.8.2 REQUIRED DELIVERABLES OR ARTIFACTS

See the Project Classification Matrix for deliverables by project type.

### 2.2.8.3 RELATED PROCESSES

Contractors and Consultants must comply with any and all related California ISO Policies, processes, and procedures, including but not limited to:

- Release Management Process
- Change Management Processes

## 2.2.9 CLOSE OUT PHASE


During this phase, all project close-out activities are performed.

### 2.2.9.1 KEY ACTIVITIES

- All documentation is completed.
- Close out contracts and budgets.
- Hold lessons learned meetings.
- Prepare final status report.
- Provide performance feedback to team members.

### 2.2.9.2 REQUIRED DELIVERABLES OR ARTIFACTS

See the Project Classification Matrix for deliverables by project type.

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### 2.2.9.3 RELATED PROCESSES

Contractors and Consultants must comply with any and all related California ISO Policies, processes, and procedures, including but not limited to:

- PLC Change Management Processes

## 3 PROJECT TYPES


The goal of the PLC is to provide the common roadmap based on pre-defined project types. Project type is determined by the project manager during the initiation phase and substantiated by project oversight. The Project Classification Matrix lists all required deliverables and whether or not signature approval is required for each project type. The Project Classification Matrix is available upon request and also located under the Initiation phase on the Program Office SharePoint site. Although it is not a type, the required SDLC Lite deliverables and signature approvals are also listed on the Project Classification Matrix.

California ISO SDLC Project Types include:

- Non-IT (No System Impacts)
- New Build
- New Buy
- ISO Major Enhancement
- Vendor Enhancement
- Infrastructure Upgrade of existing System
- Technology Upgrade of existing system

SDLC Lite Lifecycle:

- Projects requiring a construction phase < 80 hours, or < 200 hours vendor development time, or similar magnitude
- Small infrastructure-only projects
- Operations & Maintenance budget
- Utilizes existing hardware
- Follows same phases as the full SDLC
- Tailors documentation deliverables to enhancement scope
- Tailors team engagement to meet scope

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### 3.1 New build

A new Software Build consists of internal development of a custom application for the purposes of carrying out new business functionality specific to the California ISO.

### 3.2 New Buy

A vendor software implementation is the purchase of an off-the-shelf software product. In some cases the software is implemented directly off the shelf; in others, the vendor is commissioned to make customizations to the software to satisfy ISO requirements.

This project type also applies to Application Service Providers (ASPs) or off-site hosted solutions for the California ISO.

### 3.3 ISO Major Enhancement

An ISO software enhancement is considered new functionality or extensive changes to existing functionality in a custom ISO application.

### 3.4 Vendor Enhancement

A vendor application enhancement is considered an enhancement to an existing vendor software application.

### 3.5 Infrastructure Upgrade of Existing System


An infrastructure upgrade is defined as an upgrade to standard Operating Systems, databases, utilities, monitoring software, or infrastructure software and hardware components. Normal maintenance of infrastructure follow ITIL processes, but when major upgrades are required, a project is established.

### 3.6 Technology Upgrade of existing system

An infrastructure upgrade is defined as an upgrade to underlying applications servers, or supporting vendor software and off the shelf products.

## 4 RELATED BUSINESS PROCESS AND PROCEDURES

Throughout execution of a project, related California ISO business processes and standards must also be followed. The following section describes the internal ISO business processes and standards associated with project development. More information is available about these processes and standards upon request.

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#### 4.1 Process Tailoring

Projects are expected to follow all standard methodology processes unless project specifics demand tailoring of such processes, and the tailoring of these processes are allowable. Please refer to the individual process and procedure documents to determine if the tailoring of said are allowable. When the tailoring of standard processes are allowable to meet specific project needs, the tailoring approach (identification of the process being tailored, specification of what was tailored, and why tailoring was necessary) must be documented.

#### 4.2 Architectural Tenants and Principals

Architectural assessment of the system based on information technology policies and standards within the California ISO. This assessment is performed during project planning and implementation phases.

#### 4.3 Business Process Development

A process that seeks to establish standards and guidelines on how the flow of information and/or data is processed within the organization.

#### 4.4 Product and Process Quality Assurance (PPQA)

Product and Process Quality Assurance is a set of activities designed to evaluate the *process* by which project work products are developed and/or maintained, and an evaluation of the *work products* to determine if they are following established processes.

#### 4.5 Risk and Issue Management Processes


Risk Management is the process of identifying, analyzing, and responding to project risk in order to minimize any potential adverse effects. Issue Management is the mitigation of project issues that impact project success if not addressed.

#### 4.6 Information Security Standards

Information security standards facilitate the implementation and management of the California ISO's Information Security Policy and support the California ISO Enterprise Information Security Architecture. The standards must be followed when planning, designing, building, creating, developing, enhancing, implementing, maintaining, and using California ISO networks, gateways, front-ends, information systems, applications, databases, computer-based tools, and information assets. The California ISO's Information Security Standards can be viewed at: <http://www.caiso.com/1c4b/1c4b9eb91d880.pdf>

#### 4.7 Physical Security Standards

Physical Security manages badge issuance and access levels, visitor greeting and admittance, and management of the security force that maintains a secure perimeter around California ISO facilities.


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#### **4.8 ITIL Change Management Processes**

Change Management processes ensure that standardized methods and procedures are used for efficient and prompt handling of all changes to controlled IT infrastructure, in order to minimize the number and impact of any related incidents upon release to production environments.

#### **4.9 ITIL Configuration and Release Management Processes**


This process is a discipline that applies technical and administrative direction and surveillance to identify and document the functional and physical characteristics of a configuration item, control changes to those characteristics, record and report change processing and implementation status, and verify compliance with specified requirements.

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## 5 SUPPORTING TOOLS

The following standard systems, tools, and utilities are utilized at the California ISO for project execution. Contractors and consultants must comply with the usage of these tools unless otherwise noted in the consulting agreement.


Tool	Usage
Microsoft Project	Project Schedule Creation
Microsoft Project Server and Microsoft SharePoint	<ul style="list-style-type: none"> <li>• Resource Management</li> <li>• Project Metrics</li> <li>• Issue Management</li> <li>• Risk Management</li> <li>• Project Documentation Management</li> </ul>
Mercury Quality Center	<ul style="list-style-type: none"> <li>• Requirements Management</li> <li>• Test Case Documentation</li> <li>• Test Execution</li> </ul>

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## 6 PROJECT ROLES AND RESPONSIBILITIES

Below is a list of typical roles and responsibilities for project governance and management. Please refer to the Team Roles and Responsibilities document for a complete listing of roles and responsibilities for project teams. The Team Roles and Responsibilities document can be found on the Program Office SharePoint site accessible on eCurrent. Roles and responsibilities specific to each project will be defined in the project plan.


Project Role - Name	Project Responsibilities
Executive Sponsor	<ul style="list-style-type: none"> <li>• Holds overall ownership of the project</li> <li>• May participate in Steering Committee meetings to track project progress against scheduled milestones and support key decision making for mitigation planning and issue resolution</li> <li>• Approves project change order requests that effect budget</li> </ul>
Project Sponsor	<ul style="list-style-type: none"> <li>• Communicates and manages the project priority</li> <li>• Supports project objectives by providing project funding and resources</li> <li>• May participate in Steering Committee meetings to track project progress against scheduled milestones</li> <li>• Supports key decision making for mitigation planning and issue resolution</li> <li>• Supports review and approval processes for appropriate project artifacts and all project change order requests</li> </ul>
Project Oversight	<ul style="list-style-type: none"> <li>• Provides project oversight and delivery support</li> <li>• Ensures project conformance to California ISO PLC, SDLC and other formalized business processes</li> <li>• Reviews project artifacts as needed (project plans, schedules, contracts, etc)</li> <li>• Monitors project weekly performance reports (status / schedule / budget)</li> <li>• Reviews and approves all project change requests</li> <li>• As needed, facilitates project review meetings to track project progress against budget, scheduled milestones, and supports key decision making for risk mitigation planning and issue resolution</li> <li>• Facilitates resolution of escalated project issues (resources, design, technology, etc) with management</li> </ul>

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Project Role - Name	Project Responsibilities
Project Manager	<ul style="list-style-type: none"> <li>• Creates applicable funding and contract artifacts</li> <li>• Executes project approval</li> <li>• Develop Project Management Plan – includes all project scope, schedule, budget, quality, staffing and project organization, communication, risk, knowledge transfer, and procurement</li> <li>• Direct and Manage Project Execution – includes team meetings. Also includes coordination of various activities for resource scheduling, environment build out, market simulation, Release Management, CMR creation, etc.</li> <li>• Monitor and Control Project Work – includes management of issues, risks, constraints, and budget utilization (earned value metrics)</li> <li>• Project Reporting and Communication – includes weekly status reporting and single point of contact all communication regarding project objectives and status</li> <li>• Project Change Control – includes changes to scope, schedule, budget, and resource</li> <li>• Project Closure – performs a lessons-learned exercise and close out contracts and budget</li> </ul>

## 7 COMPLIANCE

All California ISO employees, consultants, and contractor personnel must comply with the Program Lifecycle Methodology. Consultants and contractors affected by this Methodology are subject to termination if out of compliance. In addition, all violations may result in the loss of some or all user privileges.

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## 8 APPROVAL

### 8.1 Standard approval signatures

Certain documentation requires signature approval. Required signatures will depend on the type of documentation that is created. The Program Office along with other departments has established the standards and guidelines for signature requirements. The standards and guidelines are outlined in the applicable standard SDLC templates and on the ISO Responsible, Approve, Contribute, or Inform (RACI) matrix template.